Safe Rechargeable Li-based Batteries for Human-rated Space Applications

PROJECT TEAM INFO

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PROBLEM OR CHALLENGE OVERVIEW

Li-ion batteries are the most popular rechargeable battery chemistry today. However, the increase in energy density with this chemistry is insufficient to meet the long term as well as high specific capacity requirements for human-rated missions. The li-ion battery chemistry is also prone to venting, fire and thermal runaway if not designed correctly or not screened stringently for faults. The challenge is to obtain a li-based rechargeable battery chemistry that is inherently safe and has a high specific capacity of greater than 250 Wh/kg.

CONTEXT OF CHALLENGE

NASA-JSC's Battery team is seeking partnerships and collaborations in obtaining a Li-based rechargeable battery chemistry that is inherently safe.

DESIRED OBJECTIVES & OUTCOMES

Manufacture and test rechargeable cells in cell formats greater than 10 Ah capacity.

ATTEMPTED SOLUTIONS AND/OR CURRENT R&D ACTIVITIES

Self-extinguishing electrolyte, flame-retardant electrolytes, coated cathodes, zero-volt tolerant anodes, new cathode and anode materials, high-voltage range electrolytes

PARTNERSHIPS / COLLABORATIONS

NASA is seeking partnerships and collaborations with industry to not only provide innovative solutions in improved materials but also in scaling up and manufacturing of cells of high capacities (>10 Ah) that can provide proof of specific capacity and safety.